

CLAIMS

1. A method comprising:

converting, by a computing device, unstructured service requests to one or more structured answer objects, each structured answer object comprising hierarchically structured historic problem diagnosis data; and

in view of a product problem description:

identifying a set of the one or more structured answer data objects, each structured solution data object in the set comprising term(s) and/or phrase(s) related to the product problem description; and

providing historic and hierarchically structured problem diagnosis data from the set to an end-user for product problem diagnosis.

2. A method as recited in claim 1, and wherein the problem diagnosis data comprise any one or more of a product problem description, symptom, cause, and resolution.

3. A method as recited in claim 1, and wherein the problem diagnosis data comprise a link to a product support article.

4. A method as recited in claim 1, and wherein converting, identifying, and providing are performed by a server computing device, and wherein the method further comprises:

receiving, from a client computing device, the product problem description;
and

wherein providing further comprises:

searching an index for terms and/or phrases that match term(s) in the product problem description to identify the one or more structured answer objects in the set;

communicating the set to the client computing device for display by a troubleshooting wizard to the end-user.

5. A method as recited in claim 1, wherein the method further comprises dynamically generating a knowledge base article from information provided by the set.

6. A method as recited in claim 1, wherein after converting and before identifying and providing, the method further comprises:

generating an index by:

extracting features from the structured answer objects;

analyzing the features to identify the terms and the phrases;

assigning relevance weight to the terms and the phrases;

normalizing terminology within the terms and the phrases; and

wherein identifying is based on information in the index.

7. A method as recited in claim 6, wherein after converting and before identifying and providing, the method further comprises:

clustering respective ones of the structured answer objects based on the index to group related structured answer objects; and

wherein providing, if there is more than one structured answer object in the set, the set comprises a reinforced cluster of structured answer objects.

8. A method as recited in claim 7, wherein clustering comprises reinforced and unified clustering operations.

9. A method comprising:

communicating a search request to a server computing device, the search request comprising a product problem description;

responsive to receiving a response to the search request, presenting, by a troubleshooting wizard, information from the response; and

wherein the information comprises hierarchically structured historic problem diagnosis data, the historic problem diagnosis data being associated with term(s) and/or phrase(s) related to the product problem description.

10. A method as recited in claim 9, wherein the historic problem diagnosis data comprise any one or more of hierarchically structured product problem description, symptom, cause, and resolution information.

11. A method as recited in claim 9, wherein the information comprises a link to a product support article.

12. A method as recited in claim 9, wherein the information comprises a set of structured answer objects.

13. A method as recited in claim 12, wherein respective ones of the structured answer objects are clustered by the server as corresponding to one another, the clustering being based on reinforced clustering operations.

14. A method as recited in claim 13, wherein the clustering is further based on unified clustering operations.

15. A computer-readable media comprising computer-executable instructions for:

converting, by a computing device, unstructured service requests to one or more structured answer objects, each structured answer object comprising hierarchically structured historic problem diagnosis data; and

in view of a product problem description:

identifying a set of the one or more structured answer data objects, each structured solution data object in the set comprising term(s) and/or phrase(s) related to the product problem description; and

providing historic and hierarchically structured problem diagnosis data from the set to an end-user for product problem diagnosis.

16. A computer-readable media as recited in claim 15, and wherein the problem diagnosis data comprise any one or more of a product problem description, symptom, cause, and resolution.

17. A computer-readable media as recited in claim 15, and wherein the problem diagnosis data comprise a link to a product support article.

18. A computer-readable media as recited in claim 15, and wherein converting, identifying, and providing are performed by a server computing device, and wherein the computer-executable instruction further comprise instructions for:

receiving, from a client computing device, the product problem description;
and

wherein providing further comprises:

searching an index for terms and/or phrases that match term(s) in the product problem description to identify the one or more structured answer objects in the set;

communicating the set to the client computing device for display by a troubleshooting wizard to the end-user.

19. A computer-readable media as recited in claim 15, wherein the computer-executable instruction further comprise instructions for dynamically generating a knowledge base article from information provided by the set.

20. A computer-readable media as recited in claim 15, wherein after converting and before identifying and providing, the computer-executable instruction further comprise instructions for:

generating an index by:

extracting features from the structured answer objects;

analyzing the features to identify the terms and the phrases;

assigning relevance weight to the terms and the phrases;

normalizing terminology within the terms and the phrases; and

wherein identifying is based on information in the index.

21. A computer-readable media as recited in claim 20, wherein after converting and before identifying and providing, the computer-executable instruction further comprise instructions for:

clustering respective ones of the structured answer objects based on the index to group related structured answer objects; and

wherein providing, if there is more than one structured answer object in the set, the set comprises a reinforced cluster of structured answer objects.

22. A computer-readable media as recited in claim 21, wherein clustering comprises reinforced and unified clustering operations.

23. A computer-readable media comprising computer-executable instructions for:

communicating a search request to a server computing device, the search request comprising a product problem description;

responsive to receiving a response to the search request, presenting, by a troubleshooting wizard, information from the response, the information comprising hierarchically structured historic problem diagnosis data, the historic problem diagnosis data being associated with term(s) and/or phrase(s) related to the product problem description.

24. A computer-readable media as recited in claim 23, wherein the historic problem diagnosis data comprise any one or more of hierarchically structured product problem description, symptom, cause, and resolution information.

25. A computer-readable media as recited in claim 23, wherein the information comprises a link to a product support article.

26. A computer-readable media as recited in claim 23, wherein the information comprises a set of structured answer objects.

27. A computer-readable media as recited in claim 26, wherein respective ones of the structured answer objects were clustered by the server as corresponding to one-another, the clustering being based on reinforced clustering operations.

28. A computer-readable media as recited in claim 27, wherein the clustering is further based on unified clustering operations.

29. A computer-readable media comprising a structured solution request data structure for use in product problem analysis and diagnosis, the structured solution request data structure comprising:

a product problem description data field;

a product problem cause data field;

a product problem resolution data field; and

wherein the product problem description data field is a parent node of the product problem cause data field, and the product problem cause data field is a parent node of the product problem resolution data field.

30. A computer-readable media as recited in claim 29, wherein the structured solution request data structure further comprises a product problem symptom data field, the product problem description field being a parent node of the product problem symptom data field.

- 31.** A computing device comprising:
- a processor; and
 - a memory coupled to the processor, the memory comprising computer-program instructions executable by the processor for:
 - converting, by a computing device, unstructured service requests to one or more structured answer objects, each structured answer object comprising hierarchically structured historic problem diagnosis data; and
 - in view of a product problem description:
 - identifying a set of the one or more structured answer data objects, each structured solution data object in the set comprising term(s) and/or phrase(s) related to the product problem description; and
 - providing historic and hierarchically structured problem diagnosis data from the set to an end-user for product problem diagnosis.
- 32.** A computing device as recited in claim 31, and wherein the problem diagnosis data comprise any one or more of a product problem description, symptom, cause, and resolution.
- 33.** A computing device as recited in claim 31, and wherein the problem diagnosis data comprise a link to a product support article.

34. A computing device as recited in claim 31, and wherein converting, identifying, and providing are performed by a server computing device, and wherein the computer-executable instruction further comprise instructions for:

receiving, from a client computing device, the product problem description;
and

wherein providing further comprises:

searching an index for terms and/or phrases that match term(s) in the product problem description to identify the one or more structured answer objects in the set;

communicating the set to the client computing device for display by a troubleshooting wizard to the end-user.

35. A computing device as recited in claim 31, wherein the computer-executable instruction further comprise instructions for dynamically generating a knowledge base article from information provided by the set.

36. A computing device as recited in claim 31, wherein after converting and before identifying and providing, the computer-executable instruction further comprise instructions for:

generating an index by:

extracting features from the structured answer objects;

analyzing the features to identify the terms and the phrases;

assigning relevance weight to the terms and the phrases;

normalizing terminology within the terms and the phrases; and

wherein identifying is based on information in the index.

37. A computing device as recited in claim 36, wherein after converting and before identifying and providing, the computer-executable instruction further comprise instructions for:

clustering respective ones of the structured answer objects based on the index to group related structured answer objects; and

wherein providing, if there is more than one structured answer object in the set, the set comprises a reinforced cluster of structured answer objects.

38. A computing device as recited in claim 37, wherein clustering comprises reinforced and unified clustering operations.

- 39.** A computing device comprising:
- a processor; and
 - a memory coupled to the processor, the memory comprising computer-program instructions executable by the processor for:
 - communicating a search request to a server computing device, the search request comprising a product problem description;
 - responsive to receiving a response to the search request, presenting, by a troubleshooting wizard, information from the response, the information comprising hierarchically structured historic problem diagnosis data, the historic problem diagnosis data being associated with term(s) and/or phrase(s) related to the product problem description.
- 40.** A computing device as recited in claim 39, wherein the historic problem diagnosis data comprise any one or more of hierarchically structured product problem description, symptom, cause, and resolution information.
- 41.** A computer-readable media as recited in claim 39, wherein the information comprises a link to a product support article.
- 42.** A computer-readable media as recited in claim 39, wherein the information comprises a set of structured answer objects.

43. A computer-readable media as recited in claim 42, wherein respective ones of the structured answer objects were clustered by the server as corresponding to one-another, the clustering being based on reinforced clustering operations.

44. A computer-readable media as recited in claim 43, wherein the clustering is further based on unified clustering operations.

45. A computing device comprising:

means for converting unstructured service requests to one or more structured answer objects, each structured answer object comprising hierarchically structured historic problem diagnosis data; and

in view of a product problem description:

means for identifying a set of the one or more structured answer data objects, each structured solution data object in the set comprising term(s) and/or phrase(s) related to the product problem description; and

means for providing historic and hierarchically structured problem diagnosis data from the set to an end-user for product problem diagnosis.

46. A computing device as recited in claim 45, and wherein the problem diagnosis data comprise any one or more of a product problem description, symptom, cause, and resolution.

47. A computing device as recited in claim 45, and wherein the problem diagnosis data comprise a link to a product support article.

48. A computing device as recited in claim 45, and further comprising:
means for receiving, from a client computing device, the product problem description; and

wherein the means for providing further comprises:

means for searching an index for terms and/or phrases that match term(s) in the product problem description to identify the one or more structured answer objects in the set; and

means for communicating the set to the client computing device for display by a troubleshooting wizard to the end-user.

49. A computing device as recited in claim 45, further comprising means for dynamically generating a knowledge base article from information provided by the set.

50. A computing device comprising:

means for communicating a search request to a server computing device, the search request comprising a product problem description;

responsive to receiving a response to the search request, means for presenting information from the response, the information comprising hierarchically structured historic problem diagnosis data, the historic problem diagnosis data being associated with term(s) and/or phrase(s) related to the product problem description.

51. A computing device as recited in claim 50, wherein the historic problem diagnosis data comprise any one or more of hierarchically structured product problem description, symptom, cause, and resolution information.

52. A computer-readable media as recited in claim 50, wherein the information comprises a link to a product support article.

53. A computer-readable media as recited in claim 50, wherein the information comprises a set of structured answer objects.

54. A computer-readable media as recited in claim 53, wherein respective ones of the structured answer objects were clustered by the server as corresponding to one another.